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TRANSNATIONAL CORPORATIONS IN THE ALUMINIUM INDUSTRY *

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CHAPTER I

INTRODUCTION

1. In July 1977, an aide-memoire was signed by the Executive Secretaries of the Economic Commission for Latin America (ECLA) and the Economic and Social Commission for Asia and the Pacific (ESCAP), dealing with possibilities for regional co-operation between the two commissions in the field of transnational corporations. In the aide-memoire, the Executive Secretaries agreed to launch an inter-regional project on transnational corporations in export-oriented primary commodities. Based on appropriate provisions made in the document, the Economic Commission for Africa (ECA) joined the project early in 1978.

2. It was agreed that the regional commissions concerned, together with the United Nations Centre on Transnational Corporations, would co-operate in the conduct of in-depth case studies on the involvement of transnational corporations in export-oriented primary commodities in the developing countries. In order to provide a common focus, a general conceptual framework for the conduct of case studies was developed.

3. The common focus of the case studies is to be on the specific issues surrounding the following two areas of concern:

(a) Factors determining the relative bargaining positions of host Governments and transnational corporations;

(b) The resulting structure of distribution of gains between host countries and transnational corporations.

4. This study is based on reports of the involvement of transnational corporations in the aluminimum industry in the three regions and draws freely from these reports to illustrate the points advanced. It has been necessary to draw on additional sources to illustrate points which were not developed in the reports; these sources are acknowledged.

5. The second chapter describes the industry in general from mining through refining of bauxite to smelting the fabrication of metal. Features that are significant in later discussions are highlighted. Total world resources in bauxite, alumina plant and smelting capacities are listed with their ownership structure in order to bring out clearly the importance of transnational corporations in the industry. This list represents the situation in 1978 with revisions where information is available. It does not take account of recent smelter and other closures due to the present world economic recession.

6. The nature of the market in the industry and the dominance of transnational corporations in all facets of the industry are described in the third chapter. Of particular interest in the volume of trade between associates, affiliates and subsidiaries, a factor that has determined prices in the industry and led to considerable transfer of prices unrelated to the value of product traded, a practice which ensures maximum global profitability to the TNCs. The influences of the London Metal Exchange and the International Bauxite Association on prices in this market are also examined.

7. Chapter 4 examines the general features of contract agreements in the industry in order to assess the bargaining position of producer countries in negotiations with TNCs, a topic that is discussed in Chapter 5.

8. A very important aspect of this study is the analysis of the distribution of gains to both TNCs and the host country, which is contained in Chapter 6. Although material for this chapter was limited, the Ghana and Guinea reports provided enough data for a useful analysis.

9. Chapter 7 lists host country actions, to ensure equitable distribution of gains. Although considerable strides have been made in improving host country revenues, control of the industry is still largely in the hands of the TNCs which are effectively switching capacity to areas where measures taken by host countries have a minimal impact.

CHAPTER II

SURVEY OF PRODUCTION AND PROCESSING

10. Aluminium is the third most abundant element in the earth's crust; but it does not, however, occur in its natural state as an element and its commercial and economical extraction from its ore, bauxite, is a recent development.

A. Definition

11. Bauxite is a rock, either consolidated or unconsolidated, that is rich in aluminium hydrate or hydroxide minerals and many contain amorphous matter. Although bauxite is mainly processed into aluminium metal, it is also the raw material used in the production of alumina chemicals such as aluminium sulphate, refractory bricks for lining high temperature furnaces and abrasives.

12. There are three main types of bauxite. Bauxites composed chiefly of gibbsite are commonly termed trihydrate bauxite or surinam type. Those composed of boehmite or diaspore are called monohydrate bauxite or European type. Those composed of a mixture of gibbsite and some monohydrate are termed mixed bauxite.

13. The term Jamaican type bauxite is applied to very fine grained, high iron, gibbsitic bauxite containing minor quantities of boehmite. 1/

14. There are several classifications for bauxite deposits in the world. They are based on mode of occurrence of the deposits, their mineralogy, their age or even

1/Modified after S.H. Patterson, Bauxite Reserves & Potential Aluminium Resources of the World" U.S.G.S. Bulletin, No. 1228 (1967)

their geographical distribution. 1,2,3 /. A simple classification divides these deposits into two groups.

1. Lateritic-type bauxites

15. These are residual deposits formed in warm wet climates from rocks with good internal drainage and under conditions favourable for the accumulation of aluminium in the form of hydrated oxides and the leaching of other constituents from the parent rock. These deposits tend to cap elevated topographic areas, as in Guinea, in some cases, they have been submerged by subsequent tectonic activity and covered by deposits of younger rocks, as in Mackenzie, Guyana.

2. Karstic type bauxites (Terra Rosa Type)

16. These are accumulations of bauxite material in depressions in karst topography in limestone areas such as the deposits in Jamaica. Again, these may be subjected to further tectonic activity and become buried, such as some deposits in Hungary.

17. For the purpose of this study classifications based on factors other than accessibility for economic exploitation are not useful. It is important, therefore, that deposits be viewed in this light when considering the resources of various countries. There are a few classifications, mainly from the U.S. Classification of Mineral Resources, on which the reserves to be reproduced in this study are based.

18. However, the concept of mineable bauxite in situ does not provide for a fair comparison of various resources; Jurgen Lotze has proposed a classification based on the cost of delivered bauxite at a standard alumina. 4/ Although this represents progress in the classification of economic bauxite resources, its application involves consideration of complex factors which are not justified here. For example, an important omission in Lotze's analysis is consideration of the intrinsic value of the bauxite itself which is now a significant factor in the revenue of producer countries. This concept will be discussed further in the pricing of the commodity.

B. Processes of production

19. For the purposes of, this study, processes of production are confined to those necessary for the production of aluminium metal and finished aluminium products. Reference has already been made to other uses of bauxite, but these form only a minor exploitation of the ore and do not feature prominently in the aluminium trade, the main subject of this study.

2/ G. Weisoe,"Bauxite Lateritique et Bauxite Karstique", ICSOBA Symposium, 1964.

3/ V.G. Hill,"Bauxite and the Aluminium Industry", Reserves and Technological Alternatives.

4/Jurgen Lotze, Economic Evaluation of World Bauxite Resources, ICSOBA, Athens 1978 Vol. 2 - Bauxite.

20. These other uses, however, may be important in particular cases in the diversification of the products of particular companies and will be referred to in the study to demonstrate the complexity of the bauxite trade.

21. The processes of production of aluminium products from bauxite are as follows.

1. Mining

22. Most bauxite deposits occur near the surface of the earth, have very little overburden and are mined cheaply by open cast methods, such as the Boke Deposits in Guinea. There are, however, other deposits which have been submerged under several metres of overburden and could not be mined economically by open cast methods except for the fact that they have special characteristics which increase their value over and above other bauxites. An example, of these is found in the deposits at Mackenzie, Guyana: they are mainly refractory and chemical grade bauxites which cost nearly as much as refined alumina. It is therefore profitable to mine them despite the excessive overburden.

23. The most expensive bauxites are those which are mined underground such as those of Hungary.

2. Beneficiation

24. Where alumina plants are located on or very close to the mine, the bauxite is usually not processed beyond blending and grinding so as to provide a constant feed for the plant. Where the bauxite has to be transported over long distances, it must be beneficiated in some manner or transportation should be organised in such a way as to make it competitive with other sources of supply. 5/

25. The two main methods of upgrading the ore are by washing and drying.

26. Ghana ore is washed in order to reduce the silica content that is concentrated in clays associated with the ore. Since the ore is free dripping, drying with heat is unncessary before shipment. Moisture content of less than ten per cent is easily achieved in the export product. The bauxite exported from Mokanji in Sierra Leone is similar to Ghana bauxite and, until recently, was not dried before export.

27. Jamaican ore, on the other hand, is fine grained and retains a lot of moisture in its natural state. It is necessary to heat dry it before export.

28. To optimise operations, some companies process the washings from the beneficiation into alumina; this is the case for the Guyana Bauxite Company in its Linden operations.

5/The transportation factor is exteremely important in the profitability of bauxite exprots. This will become evident as this study develops. The efficient loading in Australian ports, both as to rate of loading and capacity of vessels, quite apart from the size of its deposits, makes Australia capable of dictating prices on the Japanese market. The West African-European trade is similarly dominated by Guinea partly because of its superior port facilities.

3. Alumina production

29. Alumina used for smelting into aluminium is obtained by variations of a method patented by Karl Bayer in 1888 and generally known as the Bayer Process. The following are two main variations of this process and depend on the type of predominate aluminium hydrate mineral in the bauxite. The American Bayer Process is used in the processing of gibbsitic (trihydrate) ore and involves the digestion of the bauxite at low temperature and pressure with low caustic concentration. The European Bayer Process involves digestion of boehmitic or diasporic (monohydrate) ore with higher caustic concentration at higher temperature and pressure.

30. Basically the Bayer technology involves the digestion of ore with caustic soda solution. After digestion, the impurities are allowed to settle, and are thus separated from the sodium aluminate liquor which is decanted. The liquor is allowed to cool, thus concentrating the sodium aluminate in the solution, and then seeded with alumina crystals to help the crystallisation of hydrate. The hydrate is then filtered off and dried, ready to be fed into a smelter.

31. Two types of alumina are produced: floury alumina, which is very fine grained; and sandy alumina, a coarser variety. To produce sandy alumina it is important that the level of organic acids in the digestion liquor be low, as organic acids tend to collect around the tiny crystals and prevent them from growing. To overcome this, bauxite with high organic carbon are blended with bauxite low in organics to reduce their organic acid content.

32. Another important factor in the cost of alumina production is the level of reactive sillica in the bauxite. This combines with caustic soda to form sodium aluminium silicate and leads to the loss of valuable alumina and some caustic soda which cannot be recovered for recycling.

33. For the processing of diasporic ores, lime must be added to the caustic liquor to facilitate digestion.

34. The important factor to be noted at this stage is that specific types of alumina are produced for specific smelters. Smelters cannot shift from sandy to floury alumina without coast and therefore the market for metallurgical alumina is restricted to specific smelters.

4. Aluminium production

35. The process for production of aluminium from alumina was simultaneously discovered by Charles Martin Hall in the United States and Paul L.T. Heroult in France and is, therefore, generally known as the Hall-Heroult method. It involves electrolysis of alumina in a cryolite bath. This stage of the process requires a tremendous amount of electrical energy, and the location of aluminium smelters all over the world is determined to a large extent by the availability of cheap electrical power.

36. There are two types of electrolytic cells commonly in use in the industry:

(a) Sodeberg cell

37. The sodeberg cell has an anode which is a rectangular steel shell packed with briquets of coke and pitch. This is suspended above a steel case lined with carbon which serves as the cathode. The cathode is filled with a mixture of cryolite and alumina. Electricity is conducted through the electrolyte by steel pins embedded in the anode mass. When the cell is in operation, the aluminium collects at the bottom of the Cathode vessel and may be tapped at will.

38. The scdeberg method is continous and therefore requires less labour and attention and no anode fabricating and rodding facilities as does the prebaked system. However, the sodeberg method is also less efficient in terms of energy, collection of hazardous off-gass from the pots and recovery for re-use of fluorine from that off-gas. With energy and environmental costs a growing concern, at least in industrialized smelting countries, the sodeberg method is being replaced by the prebaked anode cell.

(b) Prebaked anode cell

39. The prebaked anode cell has a set of baked anode blocks made of pitch and coke suspended over the cryolite alumina bath. As the anodes are consumed, they are replaced. Here again the aluminium produced settles at the bottom of the cell and is eventually syphoned off. In Ghana the VALCO Smelter uses prebacked anode cells.

40. The metal produced directly from the smelter is known as primary aluminium and may be of various purities. At present, demand is most common for metal of 99.7 per cent purity, prices are usually quoted at 99.5 per cent with escalations for higher purity material.

41. The smelter and semifabrication stage and the fabrication of end products yield considerable scrap, in some cases as much as 60 per cent of the original material. This is remelted and used again; it is generally referred to in the industry as "new scrap".

42. Because of the high cost of energy and the amount of electrical energy required for primary smelting, it is a lucrative business to collect discarded aluminium objects such as beverage cans and remelt them to recover the aluminium. This type of scrap is generally referred to as "old scrap".

43. The recovery of aluminium from scrap has become an important source of aluminium metal.

5. Semifabrication

44. The main products of aluminium smelters are sows, ingots, rolling slabs and extrusion billets. The sows and ingots are mainly used by foundries with their own alloying facilities. The rolling slabs and extrusion billets are used directly for semi-fabrication.

(a) Manufacture of sheets and circles

45. The conventional method for making sheets is by hot and cold mill. The rolling slabs are heated and then rolled in a hot mill. The cold mill is used for finishing the sheet to the right size for ultimate use in fabrication into roofing sheets, truck bodies, boats, aeroplanes, mobile homes and circles for holloware.

(b) Continuous sheet casters

46. In the production of foils and other packaging material it is now customary to use continuous casters. These receive either molten metal directly from smelters or purchase ingots which ar then melted and allowed to spew out of a slit in a container on to the space between two water-cooled drums. The metal solidifies as it leaves the slit and is gradually pulled out by the drums. The resulting sheet is cold rolled to the final size for use.

(c) Properzi plants

47. Cable and wire manufacturers use a properzi plant which works on the same principle as the continuous caster except that it produces thick rods for subsequent drawing.

(d) Manufacture of profiles and tubes

48. Extrusion billets are used for making shapes, forms and tubes. The process involves pushing the billet through a die which produces particular shapes or form which are then used in the manufacture of windows, door frames and other constructional material.

6. Uses of aluminium

49. Because of its light weight, its antirust properties and its electrical and heat conductivity, aluminium has wide applications in industry. Its principal uses are as follows.

(a) Construction

50. It is used mainly as roofing material, cladding for walls and in window and door frames.

(b) Transportation

51. Aluminium has become an important substitute for various materials in transportation because its light weight lessens fuel consumption. It is now widely used in truck bodies, refrigerated vans, car wheels and bumpers. Aluminium engine blocks are coming into use. The classical use of the metal in this field is, of course, in the aircraft industry.

52. With the development of special alloys, aluminium has made inroads into the fabrication of ships, especially warship superstructure. Recent occurrences in the Faulkland Islands war, however, have brought this use under critical examination.

(c) Electrical uses

53. The metal is mainly used in high tension transmission. Aluminium in household wiring has run into problems in the United States and its use is now restricted. 6/

(d) Cans and containers

54. Aluminium has become an important metal for the packaging of food and drinks, especially fast foods where it is in competition with paper, and beverage cans where it faces tin cans and bottles. Containerised transporation of cargo is also an important use.

(e) Appliances and equipment

55. Because of its light weight and good heat conductivity, aluminium has become an important component of certain appliances such as refrigerators, lamp shades, solar heat collectors, cooking pots and pans.

(f) Machinery

56. New alloys of the metal have been developed which are as strong as steel and yet lighter which makes it an ideal component of certain machinery. Aluminium pistons, for example, are now common

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6/The U.S. Consumer Products Safety Commission had done extensive studies on the fire hazards caused by the use of aluminium in household wiring which has resulted in several law suits initiated by the Commission against the producers of such wiring and vice versa. The publicity has adversely affected its use in this field. Two of the cases are listed hereunder:

(i) The Consumer Produce Safety Commission V. The Anacoda Company et alia. Affidavit sworn before a U.S. Notary Public of the State of New York.

(ii) Kaiser Aluminium & Chemical Corporation V. The United States Consumer Product Safety Commission - Civil Action No. 76-44 in the U.S. District Court for the District of Delaware.

7. Competiters of bauxite and aluminium

57. Because of the rising prices of bauxite due to imposition of levies in some developing countries, but even more especially because of the strategic nature of the metal, research has been continuing on developing commercial methods of extracting aluminium from aluminous materials such as clays, alunite and anorthosites which abound in the bauxite deficient industrial countries.

58. While none of these methods is presently viable, there has been much publicity on an impending break-through. Even if this did succeed , considering the magnitude of investments in the traditional Bayer and Hall-Heroult processes, it would take several years to convert to the new technology.

59. The more important challenge to countries with medium to high grade bauxite is the development of technology in Alcoa's Western Australian refineries which commercially process gibbsitic bauxite of alumina content of about 30 per cent. The more such technology is applied to bauxites near smelting facilities the less competitive will be high grade bauxites that have to be transported over long distances to be converted into alumina before shipment to distant facilities for smelting.

60. The metal also has several competitors in its applications. Copper is the main competitor in electrical transmission; iron and steel in cans, packaging, containers, machinery and the automobile industry; paper in packaging; wood and plastics in the building and automobile industry. Aluminium, however, maintains its position because of its lightness, cheapness in relation to other metals except iron, and rust resistance.

C. Geographical distribution of bauxite resources and alumina and aluminium plants

1. Bauxite resources

61. Bauxite resources are widely distributed all over the world but the major producers are australia, Guinea and Jamaica. Brazil should be a major producer in the very near future.

62. Other important producers in the Caribbean that are not listed with the United States of America and Jamaica are Haiti and the Dominican Republic which export well over a million and a half tonnes of bauxite to the United States every year.

63. New bauxite deposits have been discovered in Venezuela, which should become an important producer when projects planned in that country develop.

64. Although bauxite is named after a village in France, bauxite production in that country has declined. European resources are now concentrated in Greece and the Socialist countries.

The table below lists the major bauxite resources of the world

Table 1
World bauxite resources 1979 a/

	Bauxite Reserves (million metric dry tons)	Recoverable aluminium equivalent (million short tons)		
		Other Reserves	Bauxite Resources b/	Total Resources b/
North America:				
United States	40	10	40	50
Jamaica	2 000	460	60	520
Other	210	50	30	80
Total	2 250	520	130	650
South America:				
Brazil	2 500	610	610	1 220
Guyana	700	190	80	270
Surinam	490 c/	130	80	210
Other	300	70	130	200
Total	3 990	1 000	900	1 900
Europe:				
Greece	700	160	60	220
Hungary	300	70	20	90
U.S.S.R. d/	300	60	70	130
Yugoslavia	400 c/	85	85	170
Other	90	20	110	130
Total	1 790	395	345	740
Africa:				
Cameroon	1 000	200	120	320
Ghana	570 c/	130	50	180
Guinea	6 500	1 500	400	1 900
Sierra Leone	130 c/	30	—	30
Other	5	—	440	440
Total	8 205	1 860	1 010	2 870
Asia:				
China	150	30	180	210
India	1 000	225	225	450
Indonesia	700 c/	150	65	215
Other	65	15	215	230
Total	1 915	420	685	1 105
Oceania:				
Australia	4 500	1 000	550	1 550
Other	20	5	30	35
Total	4 520	1 005	580	1 585
World Total	22 670	5 200	3 650	8 850

Source: Aluminium, preprint from Bulletin 671, Bureau of Mines, United States Department of the Interior, 1980 edition.

a/Data may not add to totals shown because of independent rounding.
b/Includes identified sub-economic resources and hypothetical and speculative resources. Based on bauxite resource data developed jointly by the US Geological Survey and Bureau of Mines.

c/Data published in International Bauxite Association Quarterly Review, October to December 1975.
d/Includes U.S.S.R. in Asia.

65. Africa has the largest world resources, mainly concentrated in Guinea. Other resources not listed in the table occur in Mozambique and Guinea Bissau. 7/

66. India is by far the most important producer of bauxite in Asia and more resources have been discovered recently in that country. Malaysia and Indonesia are also important exporters of bauxite.

67. Australia dominates the field in Oceania but some undeveloped resources occur on the Solomon Islands in the Pacific Ocean.

68. Table 2 shows world production of bauxite in 1971-1980.

2. Alumina plants

69. Alumina plants tend to be located near smelter or near the bauxite source. The deciding factor in location depends to a large extent on the economies of transportation and the quality of the ore. In Guinea, for example, relatively low grade ore is processed to alumina near the bauxite mine while high grade Boke ore is transported to alumina plants abroad. In Australia there is now a tendency to process bauxite locally in order to export higher cost alumina and therefore save on transportation. Many bauxite producers at present want to add more value to their exports by processing their bauxite prior to export.

70. The location and ownership of alumina plants are shown in Table 3.

3. Aluminium smelters

71. As stated above, the smelting of alumina into metal requires large quantities of cheap electrical power. Smelters, therefore, are located near hydro-electric power sources or in areas where Government-subsidised power is available at low cost for energy-intensive industries. Table 4 shows the distribution of smelting capacities in the world.

72. Europe, including the U.S.S.R., has the largest smelting capacity. The U.S.S.R. and Norway, with cheap hydro-electric power, lead with 2 873 000 tonnes installed capacity (1975). The Federal Republic of Germany has an installed capacity of 832 000 tonnes based on cheap coal resources.

73. Other European producers are Austria, Czechoslovakia, France, East Germany, Greece, Hungary, The Netherlands, Poland, Romania, Spain, Sweden, Switzerland, the United Kingdom and Yugoslavia.

7/United States, Bureau of Mines, Mineral Year book 1975 - Bauxite and Alumina, and other reports (Washington, DC).

Table 2

Bauxite production by region, 1971-1980
(In Thousands of Tonnes)

Country	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Africa										
Guinea	2630	2600	3800	7600	8406	11316	10871	11648	12199	13700
Sierra Leone	591	694	693	672	716	660	745	716	680	674
Ghana	329	340	355	363	325	268	235	340	251	197
Sub-total, Africa	3550	3634	4848	8635	9447	12244	11851	12704	13130	14571
Americas										
Jamaica	12543	12989	13600	15328	11380	10296	11434	11736	11505	11991
Surinam	6718	7777	6976	6864	4751	4588	4951	5113	4741	4364
Brazil	566	765	849	859	969	998	1040	1131	1642	4151
Guyana	4234	3668	3621	3606	3828	3108	3344	3479	3354	3052
United States	2020	1341	1909	1980	1800	1989	2013	1669	1752	1617
Dominican Republic	1032	1087	1086	1196	785	516	772	757	521	510
Haiti	765	783	743	660	522	660	588	565	560	461
Sub-total, Americas	27878	28910	28784	30493	24035	22155	24142	24450	24075	26647
Asia										
India	1517	1692	1251	1071	1274	1449	1508	1282	1934	1740
China	550	550	700	800	900	1100	1200	1400	1300	1500
Indonesia	1238	1276	1229	1290	993	940	1301	1008	1093	1249
Malaysia	978	1076	1143	948	704	660	616	615	387	920
Turkey	153	471	352	665	558	463	567	449	157	417
Sub-total, Asia	4438	5065	4675	4774	4429	4612	5192	4754	5071	5826
Europe										
USSR	7000	7400	7900	8400	6600	6700	6700	6700	6500	6500
Greece	2861	2409	2748	2783	3006	2551	2882	2630	2915	3286
Yugoslavia	1959	2197	2167	2370	2306	2033	2044	2566	3012	3138
Hungary	2090	2358	2600	2751	2890	2918	2948	2899	2976	2900
France	3184	3402	2970	2949	2563	2330	2059	1978	1970	1892
Romania	899	984	900	858	779	890	708	650	650	650
Italy	194	97	50	32	32	24	35	24	26	22
Spain	5	6	8	9	9	14	10	10	8	8
Sub-total, Europe	18192	18763	19343	20152	18185	17460	17386	17457	18057	18396
Oceania										
Australia	12733	14437	17596	1994	21003	24085	26086	24293	27583	27178
World Total	66795	70804	75154	83912	77103	80460	84307	83520	87817	91621

Source: Metallgesellschaft "Metal Statistics, 1965-75", WBMS "World Metal Statistics", January 1930 - June 1981, IDA Review, Vol, 5, No. 4, June 1980.

Table 3

World alumina plants
(Thousand tonnes)

Country, company, and plant location	Capacity Year end 1978	Ownership (present)
NORTH AMERICA		
Canada:		
Alcan Smelters and Chemicals, Ltd.		
Arvida, Quebec	1 258	Alcan Aluminium Ltd. 100%
Jamaica:		
Alcan Jamaica Ltd.		Alcan Aluminium Ltd. 100%
Ewarton, St. Catherine	566	
Kirkvine, Manchester	558	
Alcoa Minerals of Jamaica, Inc., Woodside Clarendon	544	Aluminium Co. of America (Alcoa) 100%
Alumina Partners of Jamaica, Ltd., Nain St. Elizabeth	1 179	Reynolds Metals Co. 36.5%; Anaconda Aluminium Co. 27%; Kaiser Aluminium & Chemical Corp. 36.5%
Total Jamaica	2 847 +	
United States.		Aluminium Co. of America 100%
Aluminium Co. of America:		
Bauxite, Ark	340	
Mobile, Ala	898	
Point Comfort, Tex	1 211	
Total	2 449 +	
Martin Marietta Aluminium, Inc.		Martin Marietta Aluminium Inc. 100%
St. Croix, V.I.	413	
Kaiser Aluminium & Chemical Corp.		Kaiser Aluminium & Chemical Corp. 100%
Baton Rouge, La	930	
Gramercy, La	726	
Total	1 655+	

Country, company, and plant location	Capacity Year end 1978	Ownership (present)
NORTH AMERICA (Contd.)		
United States - Continued:		
Ormet Corp., Burnside, La.	544	Ormet Corp. 100%
Reynolds Metal Co.:		Reynolds Metal Co. 100%
Hurricano Creek, Ark.	762	
Corpus Christi, Tex.	1 256	
Total	2 018 +	
Grand Total	7 079 +	
Total North America	11 384 +	
SOUTH AMERICA		
Brazil:		
Alcan Aluminio do Brasil S.A., Saramenha, Minas Gerais	91	Alcan Aluminium Ltd. 100%
Cia Brasileira de Alumino, S.A. Sorocaba, Sao Paulo	100	Industria Votorantium, Ltd. 80%, Govt. 20%
Cia Mineira de Alumino, Pocos de Caldas Minas Gerais	141	Alcoa 50%, Hanna Mining Co. 23.5% Brazillian interests 26.5%
Total Brazil	331 +	
Guyana:		
Guyana Bauxite Co. Ltd. Mackenzie	354	Government 100%
Surinam:		
Surinam Aluminium Co., Paranam	1 351	Alcoa 100%
Total South America	2 036 +	

Country, Company and plant location	Capacity Year end 1978	Ownership (present)
EUROPE		
Czechoslovakia: Zair	100	Government 100%
France: Pechiney Ugine Kuhlmann Group		Pechiney Ugine Kuhlmann Group 100%
Gardanne	730	
Salindras	263	
La Barasse	331	
Total France	1 325 +	
Germany, East:		
W.I.B., Lauta	63	Government 100%
Germany, West		
Aluminium Oxid Stade GmbH, Stade	600	Verbinigte Aluminium-Werek Ag (VW) 50%, Reynolds 50%
Gebrueder Giulini Gmbh, Ludgwigshafen	150	Gebrueder Giulini GmbH 100%
Martinserke GmbH fur Chemishce und Metallurgische Produktion Bergheim	349	Swiss Aluminium Ltd. (Alussuisse) 99.2% Government 100%
Vereinigte Aluminium-Werk AG:		
Lippenwerke, Lunen	430	
Nabrewerke, Schwandorf	210	
Total West Germany	1 738 +	
Greece:		
Aluminium de Greece S.A., Distomon	500	Pechiney Ugine Kuhlmann Group (PUK) 73% Government and private Greek interests 27%
Hungary:		
Ajka I) Ajka II) Almasfuzito) Magyarovar)	726	Government 100%
Italy:		
Alumetal S.P.A., Porte Merghera	200	Government 54%, Montedison 6%
Furallumina S.P.A., Porto Vesme, Sardinia	720	Alsar S.P.A. 41.67%, Comalco Ltd. 20%, Metallgesellschaft A.G. 17.5%, Alumetal S.P.A. 20.83%.
Total Italy	920 +	

Country, Company, and plant location	Capacity Year end 1978	Ownership (present)
EUROPE (Cont'd)		
Romania:		
Oradea	249	Government 100%
Tulcea	249	
	499 +	
United Kingdom:		
The British Aluminium Co. Ltd., Burntisland	100	Tube Investments, Ltd., 52%, Other British interests 48%
U.S.S.R.:		
Achinsk)		
Dneprovsk)		
Kamensk-Uralsky)		
Kandalaksa)		
Kiroyabad)		
Krasnoturinsk)		
Novo Kuznetsk)		
Pavlodar)		
Pikalevo)		
Sumgait)		
Volgograd)		
Volkhov-Tikhium)		
Yugoslavia:		
Totograd, Montenegro	200	Government 100%
Kidricovo, Slovenia	140	
Mostar, Bosnia Hereogovina	280	
Total Yugoslavia	620 +	
Total Europe	9 763 +	

Country, Company and plant location	Capacity Year end 1978	Ownership (present)
AFRICA		
Guinea: Friguia, Kimbo	700	Frialco Co. 51%, Govt. 49% (Frialco: Noranda (USA) 21%; PUK (France) 17%; British Aluminium (UK) 5%; Alusuisse (Switzerland) 5%; VAW (W. Germany) 3%).
Total Africa	700	
ASIA		
China, People's Republic of,:		
Nanting and other locations	363	
India:		
Aluminium Corp. of India Ltd., Jarkamagar, West Bengal	23	Aluminium Corp. of India Ltd. 100%
Bharat Aluminium Co. Korba, Madhya Pradesh	200	Government 100%
Hindustan Aluminium Corp. Ltd. Ronukoot Uttar Pradesh	150	Birla and Indian Interests 73%, Kaiser 27%
Indian Aluminium Co. Ltd., Muri, Sihar	77	Alcan 55%, Indian interests 45%
Belgaum, Mysoro	159	
Madras Aluminium Co. Ltd. Mottur Tamil Nadu	50	Madras State Government 73%, Montedison 27%
Total India	658 +	
Japan:		
Mutsui Alumina Corp., Wakamatsu	200	Mitsui Group 98.5%, other Japanese interests 1.5% Alcan 50%, Japanese interests 50%
Nippon Light Metal Co. Ltd.		
Shimisu	540	
Tomakomai	333	
Showa Denko K.K., Yokohama	620	Showa Denko K.K., 100%
Sumitomo Chemical Co. Ltd. Kikumoto	766	Sumitomo Chemical Co., 100%
Total Japan	2 457 +	
Taiwan:		
Taiwan Aluminium Corp. Kauhsiung	76	Government 100%
Turkey: Seydisehir	200	
Total Asia	3 753 +	

Country, Company, and plant location	Capacity Year end 1978	Ownership (Present)
OCEANIA		
Australia		
Alcoa of Australia (W.A.) N.L.		Alcoa 51%, Australian interests 49%
Kwinana, Western Australia	1 297	
Pinjarra, Western Australia	2 004	
Nabalco Pty. Ltd. Gove, Northern Territory	998	Alussuisse 70%, Gove Alumina Ltd. 30%
Queensland Alumina Ltd., Gladstone	2 399	Kaiser 28.3%, Alcan 21.4%, Pechiney Ugine Kuhlmann 20%, Comalco 30.3%, (Comalco: Conzinc Rio Tinto of Australia 45%, Kaiser 45%, public 10%).
	6 698+	
Total world	34 335 +	

+ Totals may not add up to components because of rounding off
O estimate

74. The next major producer is North America where facilities based on hydro-electric power are in three main areas: Northern Quebec, the North Western United States and the Tennessee Valley. Elsewhere, smelters use cheap gas and coal. The other producer of aluminium in North America besides Canada and the United States is Mexico; though its present capacity is small, new sources of energy are likely to expand it rapidly.

75. South America has modest capacities in Brazil, Surinam and Venezuela. There are still undeveloped hydrosites which could provide power for expansion in various countries in South America such as Guyana. The development of facilities in Guyana has been delayed because hydro-energy potential is located in the area whose owership is being disputed by Venezuala.

76. In Africa, aluminium is produced in Ghana, Egypt, the United Republic of Cameroon and South Africa. Libya and Nigeria are potential producers based on cheap natural gas.

77. In asia, smelters are located in Bahrain, the People's Republic of China, Dubai, India, Iran, Japan, Korea, Taiwan and Turkey. The escalation in oil prices has hit countries in this region most since many facilities are oil fueled. Japan, for example, has reduced its capacity considerably and future development in the aluminium industry is likely to be based on imported metal.

78. The oil-rich Middle East countries on the other hand, are likely to allocate increasing levels of their natural gas resources into aluminium production. Smelter projects have been discussed for Abu Dhabi and Saudi Arabia.

CHAPTER III

SURVEY OF MARKET STRUCTURE

79. The aluminium industry has for a long time been dominated by six transnational corporations in the free market economies. These include:

- Aluminium Company of Canada (ALCAN), which was originally a subsidiary of Aluminium Company of America (ALCOA) and had to become autonomous because of U.S. anti-trust laws. ALCAN is Canadian.

- The aluminium Company of America (ALCOA), the largest of the six, which was originally known as the Pittsburg Reduction Company; like ALCAN, it was owned predominantly by the Mellon, Davis and Hunt families. During the Second World Was the U.S. Government commissioned ALCOA to build and run aluminium smelters in order to increase output for the war effort. After the war these were sold to Reynolds Metals Company and Kaiser Aluminum and Chemical Corporation which are now the second and third U.S. Transnational corporations in the aluminium industry.

Table 4

World Primary Aluminium Smelters
(Thousand Tonnes)

Country, Company, plant location	Capacity Year end 1978	Ownership (present)
NORTH AMERICA		
Canada		
Alcan Smelters & Chemicals Ltd.		Alcan Aluminium Ltd. 100%
Arvida, Quebec	410	
Beauharnois, Quebec	46	
Isle Maligne, Quebec	95	
Kitimat, British Columbia	268	
Shawinigan Falls, Quebec	86	
Total	905	
Canadian Reynolds Metals Co. Ltd.		Reynolds Metals Co. 100%
Baie Comeau, Quebec	159	
Total Canada	1 064	
Mexico		
Aluminio SA de CV, Vera Cruz	67	Aluminium Company of America 44.3% Intercontinental 25.7%, Mexican interests 16%, U.S. and foreign interest 14%.
United States		
Aluminium Company of America (Alcoa)		Aluminium Company of America 100%
Alcoa, Tenn Badin, N.C. Evansville, (Warrick) Ind. Massena N.Y. Point Comfort, Tex Rockdale, Tex Vancouver, Wash Wenatches, Wash	1 569	
Total	1 569	

Country, company, plant location	Capacity Year end 1978	Ownership (present)
NORTH AMERICA (Cont'd.)		
United States - Continued		Anaconda Aluminium Company 100%
Anaconda Aluminium Co.		
Columbia Falls, Mont.	163	
Sebreem Ky	163	
Total	326	Swiss Aluminium Co. Ltd. 60%, Phelps Dodge Corp. 40%
Consolidated Aluminium Inc.		
Lake Charles, La.	46	
New Johnsonville, Tenn	131	
Total	177	
Estalco Aluminium Co.	160	Alumax, Inc. (AMX Inc. 50%, Mitsui & Co. Ltd. 45%, Nippon Steel 50%, Pechiney Ugins Kuhlmann 50%.
Intalco Aluminium Corp.		
Femdale Bellingham, Wash	236	Same as above.
Kaiser Aluminium & Chemical Corp.		Kaiser Aluminium & Chemical Corp. 100%
Chlmette, La	236	
Mead, Wash.	200	
Revenswood, W. Va	148	
Tecoma, Wash.	73	
Total	657	Martin Marrietta Corp. 87.2% private interest 12.8%
Martin Marietta Alumina, Inc.		
Goldendale, Wash.	109	
The Dalles, Oreg.	82	
	191	National Steel Corp. 50%, Southwire Co. 50%
National-Southwire Aluminium Co.		
Mawesville, Ky	168	

Country, company, plant location	Capacity Year end 1978	Ownership (present)
NORTH AMERICA (Cont'd.)		
United States - continued		
Naranda Aluminium, Inc.		Naranda Minos, Ltd. 100%
New Madrid, Mo	121	Swiss Aluminium Ltd. 40%, Revere Copper and Brass Inc. 34%, Phelps Delge Corp. 26% Leyere Copper & Brass 100%
Ormet Corp.		
Hannibal, Ohio	236	
Revere Copper & Brass Inc.		
Bcotis boro, Ala	108	
Reynolds Metals Co.		Reynolds Metals Co. 100%
Arkadelphia, Ark	62	
Corpus Christi (San Patricio), Tex	108	
Jones Mill, Ark.	113	
Listerbill (Sheffield), Ala.	183	
Longview, Wash.	190	
Massena, N.Y.	114	
Troutdale, Oreg	118	
Total	885	
Total United States	4 920	
Total North America	6 051	
SOUTH AMERICA		
Brazil		
Alcan Aluminio do Brazil S.A.		Alcan Aluminium Ltd. 100%
Saramenba, Cure Freto	54	
Aluminio do Brasil Nordesto, S.A.		
Aratu, Dahia	28	Same as above
Corpoabhia Brasileira do Aluminio		
Sarocaba, Sao Paulo	80	Industria Votorantim, Ltd. 80% Government 20%

Country, company plant location	Capacity Year end 1978	Ownership (present)
SOUTH AMERICA (Cont'd.)		
Brazil - Continued		Aluminium Company of America 50%, Hanna Co. 40% private interests 10%
Companhia Minedra de Aluminio (Alcominas):		
Pocos de Calda, Mina Gerias	60	
Total Brazil	222	
Surinam		Aluminium Co. of America 100%
Surinamo Aluminium Co. (Suralco):		
Paramam	66	
Venezuela		Reynolds Metal Co. 58% Government 50%
Aluminio del Caroni S.A. (Alcosa)		
Puerto Ordas, Mantanzas	112	
Total South America	550	
EUROPE		
Austria		Swiss Aluminium Ltd. 100%
Salzburger Aluminium CmbM (SAG)		
Lond, Salzburg	12	
Vereinigte Metallwerke Ranshofen Berndorf AG (VMRB)		Government 100%
Ranshofen, Draunau A Inn	80	
Total Austria	102	
Czechoslovakia		Government 100%
Zia Aluminium Works:		
Ziar-on-Nron	65	
France:		Pechiney Ugine Kuhlmann Group 100%
Pechiney Uginey Kuhlmann Group (PUK)		
Auzt, Ariego	31	
L'Argentiare, Naute-Alpes	39	
La Fraz, Savioie	4	
La Saussaz, Savoir	12	
Lannemezan-Haute Pyrenees	57	
Nogures, Dasses-Pyrenees	115	
Ricuperoux, Isore	25	
St. Jean de Naurenne, Saveie	75	
Sabart, Ariege	24	
Venthen, Savoir	28	
Total France	410	

Country, Company, plant location	Capacity Year end 1978	Ownership (present)
Germany, East		
Klechrochemisches Kombinat:		
Ditterfeld	55	
Lantawerk	30	
Total Germany, East	85	Swiss Aluminium Ltd. 99.85%
Federal Republic of Germany		
Aluminium-Nuttee Rheinfelden GmbM		
Rheingeldon, Baden	50	ALCAN 100%
Gebrueder Giulini GmbH		
Ludwigshafen	45	
Kaiser-Proussag Aluminium GmbH & Co.		Kaiser Aluminium & Chemical Corp. 50%
Veerdo	132	Proussag AG 50%
Leichmetall GmbH		Metallgesellschaft AG 50%, Swiss Aluminium Ltd. 50%
Essen	130	Reynolds Aluminium Deutschland, Inc. 33.4%
Hamburger Aluminium-Werke GmbH		Verbinigto Aluminium-Works GmbH 33.3%
Hamburg	100	Vercinigto Metallworks Ranshefen Derndorf AG 33.3%
Vereinigto Aluminium-Works A.G. (VAW)		
Elbewerk, Stede	65	
Erfwerk, Grevenbroich	36	
Innwerke, Toging	55	
Lippenwerke, Lunen	50	
Norf, Rheinwerke	145	
Total Germany, West	808	
Greece:		
Aluminium de Greece S.A. (ADG) Distomon	145	Pechiney Ugine Kuhlmann Group 90% Government 10%
Hungary		
Magyarsoviet Bauxite Impar		Government 100%
Ajka	17	
Inota	30	
Tatabanya	15	
Total Hungary	62	

Country, Company, plant location	Capacity Year end 1978	Ownership (present)
Iceland: EUROPE (Cont'd.)		
Iceland		
Iceland Aluminium Co. Ltd.		
Hafnarfordu	88	Swiss Alumium Ltd. 100%
Italy:		
Alcan Aluminio Italiano S.P.A.		Alcan Aluminium Ltd. 100%
Dorgo-France d'Ivrea	--	Government 94% Montocatini Edison SpA 6%
Societa Mineraria Chimica Metallugiaper l'Idustria Dell'Alluminio Sordogna (Alsar):		
Parto Vesne	125	Same as above
Alumetal S.p.A.:		
Bolsune	50	
Fusina	72	
Mori	20	Swiss Aluminium Ltd. 50% Government 50%
Alluminio Veneto (SAVA)		
Fusina	30	
Porto Marghera	30	
Total Italy	327	
Netherlands:		
Aluminium Delfzijl N.V. (Aldel)		Holland Aluminium N.V. 100%
Delfzil	96	
Pechiney Nederland N.V.		
Wlissingen (Flushing)	170	Pechniey Ugine Kuhlmann Group 85% Hunter-Douglas N.V. 11%, Acan Aluminium Ltd. 4%
Total Netherlands	266	
Norway		
A/S Ardal os Sunc al Works (ASV)		Government 100%
Ardal	153	
Hoyanger	32	
Sundalsora	120	Government 100%
Det Norsko Nitridaktisolcap A/S (DNN)		
Tyssodal	24	
Lista Aluminiumverk A/S (Elkem)		
Lista	82	Aluminium Company of America 50% Elkem-Spigerverket

Country, Company, Plant location	Capacity Year end 1978	Ownership (present)
EUROPE (Cont'd.)		
Norway - Continued		Aluminium Company of America 50% Elkom-Spigerverket 50%
Mesjeon Aluminiumverk A/S (Mosal):		
Mosjoen	95	
Norsk Hydro A/Karmony Fabrikker (Inor)		
Kurmony Island	80	Norsk Hydro 100%
Seer-Morge Aluminium A/S (Saral):		Swiss Aluminium Ltd. 75%; Compadedec 25%
Husnes	72	
Total Norway	658	
Poland:		Government 100%
Ministry of Heavy Industry		
Konin Works	55	
Slawina Works	55	
Total Poland	110	
Romania:		
Slatina	200	Government 100%
Spain		
Aluminio de Galicia S.A.		Pechiney Ugine Kuhlmann Group 66%, ENDASA 17%
La Coruna	90	Government 17%
Sabihanega, Husca	14	
Empresa Nacional del Aluminio S.A. (ENDASA)		
Avilos	101	Gover nment 50.5%, Alcan Aluminium Ltd. 25%
Valladolid	25	Banco-de-Biboa SA 15%, Spanish interest 9.2%
	230	
Sweden:		
Garages Aluminium AB		
K , Sundsvall	85	Granges AB 100%

Country, Capacity, Plant location	Capacity Year end 1978	Ownership (present)
Switzerland		
Swiss Aluminium Ltd. (Alussuisse)		Swiss Aluminium Limited 100%
Chppis, Valais	36	
Steg, Yalais	48	
Usine D'Aluminium Martigny, S.A.		
Martigny	10	
Total Switzerland	94	
U.S.S.R.:		
Bogoslosk (Krasnoturinsk) Sverlovskaya Obiest, Urals	150	Government 100%
Bratsk, Irkuskaya Oblast, Siberia	--	
Irkutsk (Shelekovo) Irkutskaya Oblest, Urals	280	
Kamensk-Ural'sskiy Sverdlovaskaya Oblest, Urals	150	
Kanaker (Yerevan), Amenic	100	
Kandalaksha, Murmanskaya Oblest	60	
Kransnoyark, Kraskiy Kray, Siberia	250	
Nadvoisty, Kareskaya, U.S.S.R.	60	
Novekuznets (Stakinsk) Komoroyskaya Oblast Sibera	200	
Rogar, Duschanbe, Tadzhikstan	60	
Sumgait (Kirovabad), Azerbaijan	120	
Velgograd (Stalingrad) Leningrade Oblest	300	
Volkhov (Zanka), Leningrade Oblest	60	
Zaperizhyo (Dneprovsk) Zaperzhaskaya Oblast, Ukraine	120	
Total U.S.S.R.	1 910	
United Kingdom:		
Alcan (UK) Ltd.,		Alcan Aluminium Ltd. 100%[2]
Lynemouth, Northumberland	120	
Anglessey Aluminium Ltd.		Kaiser Aluminium & Chemical Corp. 67%
Holyhoad, New Wales, Scotland	150	Rio Tinto Zinc Corp. Ltd. 33%
The British Aluminium Co. Ltd. (DACO)		Tube Investments Ltd. 58% and other interests 42%
Invergorden, Scotland	102	
Kinlochlevon, Scotland	10	
Lochaber (Fort William) Scotland	29	
Total United Kingdom	366	

Country, company, plant location	Capacity Year end 1978	Ownership (present)
EUROPE (Cont'd.)		
Yugoslavia		Montenegro State Industry 100%
Kombinat Alumjuma Titograde		
Tito grad, Montenegro	55	
Tovarna Glinice in Aluminija Boris Kidric		Slovania State Industry 100%
Kidricevo, Slovania	75	
Tvornica Lakih Metals Doris Kidric		
Boris Kidric, Sibenik	75	Dalmatia State Industry 100%
Total Yugoslavia	205	
Total Europe	7 116	
AFRICA		
United Republic of Cameroon:		
Compagnie Camerounaiso de l'Aluminium Pechiney Ugine (Alucan):		Pechiney Ugine Kuhlmann Group 60%, Cobeal 10%
Edea	62	Cpmal Cio. 30%
Ghana:		
Volta Aluminium Co. Ltd. (Valco)		
Tema	200	Kaiser Aluminium & Chemical Corp. 90% Reynolds Metal Co. 10%
South Africa, Republic of		
Alusaf (Pty.) Ltd.		Industrial Development Corp. (Government) and
Richards Bay	80	Private south African interests 78%, Swiss Aluminium Ltd. 22%
United Arab Republic		
Naghamadi	100	Government 100%
Total Africa	442	
A S I A		
Bahrain: Aluminium Bahrain Ltd. (ALBA)	120	Kaiser Aluminium & Chemical Corp. and British Metals 17%, Western Metals 8.5% Bretton Investments 5.1%; Bahrain Government 52.4%

Country, company, plant location	Capacity Year end 1987	Ownership (Present)
Asia (Cont'd.)		
China, People's Republic of:	100	Government 100%
Fushun, Klaning)		
Changohun, Chilin)		
Changsha, Hunan)		
Hefei, Anhwei)		
Hunan, Hunan)		
Jiaozuo, Honan)	145	
Lanchow, Kansu)		
Taiyuan, Shansi)		
Tsingtao, Shantung)		
Wuhan, Hupei)		
Total China, People's Republic of	245	
India:		
Aluminium Corp. of India Ltd. (Alucoin)		Self 100%
Asansol, West Bengal	9	State Government 100%
Bharat Aluminium Co. (Calco):		
Korba, Madhya Pradesh	75	Kaiser Aluminium & Chemical Corp. 27% a/
Hindustan Aluminium Corp. Ltd. (Hindalco)		
Renukoot, Uttar Pradesh	120	Birla and Indican interests 73%
Indian Aluminium Co. Ltd. (Indel)		Alcan Aluminium Ltd. 55%, Indian interests 45%
Belgaum, Bombay	75	
Alupuram, Kerala	21	
Hiraloud, Crissa	24	
Madras Aluminium Co. Ltd. (Malco)		Montecatini Edison S.P.A. 27%, Madras
Mattur, Madra	25	State Government 75%
Total India	349	
Iran:		Iranian Government 82.5%, Reynolds Metals
Iranian Aluminium Co. (IRALCO), ARAK	50	Co. 12.5%, Pakistani Government 5%

a/Kaiser has now sold its equity in Kindalco to other Indian interests Newsweek June 4, 1979

Country, Company, plant location	Capacity Year end 1978	Ownership (present)
Japar		Mitsubishi Chemical Industries Ltd. 100%
Mitsubishi Chemical Industries Ltd.		
Naoestu	160	
Sakaido	196	
Mitimui Aluminium Co. Ltd.		Mitsui Aluminium Co. Ltd. 100%
Omuta	166	
Nippon Light Metal Co. Ltd. (NLM)		Alcan Aluminium Ltd. 50% Japanese interest 50%
Iambara	112	
Hokkaido (Tomakomai)	130	
Niigata	145	
Showa Donke Chille, Chiba	250	Showa Denko K.K. 100%
Kitakata	28	
Omachi	42	
Sumitomo Chemical Co. Ltd.		Sumitome Chemical Co. Ltd. 100%
Isoura	80	
Nagoya	54	
Toyama	189	
Sumitome Toyo Aluminium Smelting Co.		Sumitomo Chemical Co. Ltd. 100%
Shikaku, Toyo	100	
Total Japan	1 652	
Korea, Republic of:		
Aluminium of Korea Ltd. (Korala)		Korean Development Bank 50% Pechiney Ugine
Ulgan		
Taiwan:		
Taiwan Aluminium Corp. (Talco)		Government 100%
Kaohsiung, Takao	90	
Turkey		
Etibank		
Seydisahir	60	Government 100%
Total Asia	2 604	

Country, Company, Plant location	Capacity Year end 1978	Ownership (present)
OCEANIA		
Australia:		
Alcan Australia Ltd. Kurri-Kurri, New South Wales	15	Alcan Aluminium Ltd. 70.5%; other interests 29.5%
Alcoa Alcoa of Australia Ltd. Point Henry, Victoria	92	Aluminium Company of America 51%, Australian interests 49%
Comalco Ltd. Bell Bay, Tasmania	118	Kaiser Aluminium & Chemical Corp. 45% Conzinc Rio Tinto of Australia Ltd. 45% other interests 10%
Total Australia	225	
New Zealand		
New Zealand Aluminium Smelters Ltd. Bluff	150	Comalce Ltd. 50%; Sumitome Chemical Co. Ltd. 25%; Showa Denke K.K. 25%
Total Oceanic	405	
Total world	17 168	

- Two corporations are European: Pechiney Ugine Kulmann which was the result of a merger by Pechiney and Froges and Kulmann, two French companies.

- The last is Aluminium-Industrie-Aktein-Gesselschaft named Aluminium Company of Switzerland (Alusuisse).

80. There is no major aluminium project in the West that does not involve or has not involved at least one of these companies.

81. In the centrally-planned economies of Eastern Europe and Asia, the industry, like all other major industrial concerns, is owned and controlled by state corporations such as Energoinvest in Yugoslavia, the Aluminium Corporation of Hungary and the Aluminium Corporation of the USSR.

82. More recently, the industry has been invaded by smaller but significant producers of aluminium. These are mainly producers of other metals which have aluminium set up divisions to produce because of its stable returns. Examples of these are Alumax, Anaconda and Southwire Corporation.

83. Oil companies had also diversified into this industry even before the 1973 price revisions provided them with large surpluses for investment. An example is Billiton, the metals subsidiary of Royal Dutch Shell.

84. British Aluminium, although an early starter in the industry, never developed an aggressive corporate policy to expand and now ranks among the minors in the field. At one time Reynolds Metals was a substantial shareholder in the Company but sold its shares to British interests. It is likely that in the wake of the present recession, British Aluminium may be taken over by Alcan in a restructuring of the aluminium industry in Britain. 8/

85. In view of the strategic nature of the metal, there are a few state owned companies in the free market economies. Examples include Vereinigte-Aluminium-Werke (VAW) of West Germany, Morsk Hydro of Norway and Alumetal of Italy.

86. In the developing countries there has been an aggressive move either to participate in joint ventures or wholly own aluminium facilities in order to earn a fair return for the exploitation of ones own natural resources. In 1974, Jamaica negotiated 51 per cent participation in the bauxite mining companies operating in its territory; Guyana was not so successful in negotiating for participation in its bauxite/alumina industry and had to nationalise, with fair compensation, the bauxite operations of Reynolds and the bauxite and alumina facilities of Alcan in its borders. The Aluminium Corporation of India, despite power limitations, has established an integrated aluminium industry and the Companhia Vale de Rio Doce (CVRD) has set up ambitious joint-ventures with several companies for an integrated aluminium industry in Brazil. The Government of Guinea has also set up similar joint-ventures for bauxite mining and alumina production.

8/ Financial Times, Survey October 27, 1982 - Aluminium.

87. There are several important aluminium companies in Japan, their future, however, is uncertain because they were based on oil-generated power which has become so expensive as to result in drastic cuts in capacity. This will require a fundamental restructuring of the Japanese industry, to depend on imported metal with retention of a small domestic capacity for strategic purposes.

A. Ownership

88. As stated above, the aluminium industry is dominated by six transnational corporations in the West and state-owned corporations in the East. These companies are completely integrated from bauxite mining and refining to smelting and fabrication.

89. Table 5 clearly illustrate the dominance of the six TNCs over the world-wide bauxite industry. Out of a total of 17,883 million tonnes of installed capacity for aluminium smelting they own 7 862 million tonnes, or 44.5 per cent of world production capacity. Similarly they have 50.4 per cent of installed capacity for refining bauxite into alumina and 46.3 per cent of bauxite mining capacity.

90. Governments of developing countries, on the other hand, have only 5 per cent of world smelter capacity, 6.3 per cent of alumina capacity and 19.3 per cent of bauxite mining capacity. These furthermore, represent recent acquisitions, as developing countries in an effort to control industries, have arranged joint ventures for the development of these resources, bought equity into existing concerns or nationalised, with appropriate compensation, such concerns. However, as will become evident below, developing countries have found that ownership is not necessarily synonymous with control.

B. Control

91. The real power of TNCs to control the industry lies in their possession of technology and know-how; their access to markets through world -wide operations; their involvement in linkages of the industry, such as shipping; the sheer mass of information they have gathered over the years on all aspects of the industry, and the lack of visibility of prices especially at the bauxite/alumina stages because of the enormous inter-company trade.

92. TNC power is further strengthened by the magnitude of investment required in the industry, especially at the alumina and aluminium stages. This has forced even the six major TNCs in the industry first to resort to joint ventures of their own in order to minimise company financial exposure on each project and take advantage of economies of scale to reduce unit cost of production; second, to attract external financing not only from commercial banks but also from international and national financial institutions such as the World Bank and the EXIMBANK of the USA; and finally to ensure security of their investment through organizations such as OPEC. These international and national organizations ensure that agreements with TNCs for the development of bauxite and related resources either are not breached or in the event of an inevitable breach, attract fair and prompt compensation.

Table 5

Ownership of world aluminium, alumina and bauxite capacities in 1982 (In Thousands of Tonnes)

	Aluminium		Alumina		Bauxite	
	Total Capacity Owned	Percentage of world Capacity	Total Capacity Owned	Percentage of World Capacity	Total Capacity Owned	Percentage of World Capacity
The six major transnational corporations	7962	44,5	20113	50,4	51789	46,3
Other transnational corporations and private investors	3801	21,2	8642	21,7	22606	20,4
Governments of developed capitalist countries	1497	8,4	1571	4,0	323	0,3
Governments of developed socialist countries	3730	20,9	7026	17,6	15600	13,9
Governments of developing countries	893	5,0	2523	6,3	21622	19,3
TOTAL	17883	100	39875	100	111940	100

93. When developing countries want to participate in the industry, financing is normally available only with involvement of international financial organisations such as the IFC and other affiliates of the World Bank, the European Development Fund or the Export Credit Guarantee Departments of countries of the Western World; at present, in view of the collapse of economies of countries like Mexico, the approval or acquiescence of the International Monetary Fund will not be granted without certain conditions, one of which is the management of the project by a technically competent entity to ensure that loans are paid back on schedule. This entity invariably turns out to be a TNC.

94. These arrangements have tended to preserve the control of the industry by Western TNCs: indeed, attempts by developing countries at restructuring the industry in order to gain control of it have often attracted disastrous consequences. These have included cut-back in production matched with increased production in countries judged to be "safe", such as Australia and Brazil; world bank sanctions affecting the organization of the economic; and at times, as a result of economic problems, political destabilization.

95. Although it is theoretically possible for governments of developing countries independently to arrange financing, purchase technology and own and control projects in this industry, this is difficult in practice without the involvement of TNCs. Recently, however, countries off the centrally-planned economies have made arrangements with developing countries which ensure eventual control of the projects they help to establish. Essentially these arrangements involve the supply of technology, equipment and expertise by the centrally-planned economy and the sale of a portion of the products of the project to the socialist country to pay back the investment. Once the investment is paid back, the developing country owns and controls the project in full. Examples of these are the Kindia Bauxite Project in Guinea and the Bharat Aluminium Smelter in India.

C. Pricing

96. One of the major features of the bauxite/alumina trade is the invisibility of prices. This is due to the fact that until recently trade in these commodities was between affiliated companies. As a result of this practice, prices declared to governmental authorities represented those which would ensure maximum global profitability for the TNC.

1. Bauxite

97. Two significant factors in the processing of bauxite into alumina by the Bayer process affect cost: they include the content of alumina and of reactive silica in the bauxite. The richer the bauxite is in reactive silica, the less alumina is recoverable and the higher the loss of caustic soda in the process. The reactive silica combines with some alumina and soda to form sodium aluminium silicate, the aluminium content of which is lost to the final product.

98. The traditional method of pricing bauxite, therefore, involves a reference price for a base product with a system of premiums for alumina over and above the percentage of alumina in the base product and, conversely, penalties for reactive silica above the percentage of reactive silica in the base product.

99. The price in the past usually covered the cost of production plus a small margin for loan servicing and return on investment. Producers in developing countries made little or no profit. Recently, however, the concept of the intrinsic value of the bauxite itself has gained currency in countries which want to improve their earnings from bauxite development. The bauxite price has therefore been assessed from the contribution of bauxite to a generally traded derivative such as aluminium ingot. This is the fundamental idea underlining the pricing policy of the International Bauxite Association. For countries that do not own facilities for bauxite production, a bauxite levy has been imposed on the operating companies; this is usually reflected in the price build-up to the associate of the TNC which purchases the bauxite. Guinea, however, levies this tax not on the company but on the purchaser of either bauxite or alumina.

2. Alumina

100. Because it is less heterogeneous than bauxite, alumina does not have the same premium and penalties that are applied in the bauxite trade. Penalties may be imposed, however, for failing to meet specifications such as grain size. The terms and conditions of the trade are similar, though, because of its concentration in the hands of a few companies.

101. Long term contract prices are usually established between affiliated companies with price revisions by mutual agreement. This, of course, allows the TNC to determine the best price for maximum global profitability.

102. Recently, however, the introduction of the bauxite levy by some producing countries has brought about a cost factor linked to the realised price of aluminium metal which has pushed up the price of alumina. In these countries, the price of alumina to the affiliated company comprises the bauxite levy (host country revenue) and the producer price (affiliated producer company revenue). This may be termed the "levy price".

103. Bauxite and alumina production have traditionally been linked with smelter capacity of the producers of metal. Recently, however, because of the high demand of metal, some smelters have entered into the industry without a raw material base and have had to rely on long term contracts or joint ventures with the established companies for the supply of bauxite and alumina. This has led to over-capacity in the industry and to spot sales of the commodities in times of over-production. In firm markets spot prices have been high; with low demand, in the case at present, prices have tumbled depending on the quantity of material available on the open market.

3. Aluminium

104. Trade in metal is also marked by the integration of the operation of companies and the concentration of the industry in the hands of only a few transnational corporations.

105. From time to time, companies have published their prices for metal of various purities and forms in the Metal Bulletin and the American Metal Market. These are commonly referred to as the list or published price of metal. While different companies may have different published prices, the common reference price is the ALCAN list price for 99.5 per cent metal purity, although nowadays metal is mainly traded in purities of 99.7 per cent or above.

106. The list price does not represent the price at which metal is actually traded but that at which the metal producers consider investments can be made with a reasonable return. The bulk of metal actually passes hands at contract prices between affiliated companies. This is why, of all metals aluminium has been able to ride the fluctuations in metal prices for a very long time.

107. Until recently, spot prices were of relatively no significance to the aluminium metal trade as a whole. However, with the slump in the industry due to a decline in demand for metal and the high cost of management of inventory due to high interest rates, metal has become available in increasing quantities on the open market, and much of it has been traded on the London Metal Exchange.

4. The London Metal Exchange Aluminium Contract

108. Trade in Aluminium Contracts on the London Metal Exchange started on October 2, 1978 amidst stiff resistance from metal producers; they felt that it would lead to speculation and violent price fluctuations in a market that had until then been able to contain adverse economic situations because of the control of producers of metal on capacity utilisation. Its champions, however, felt that "British and European money managers may use it as a futures market for cash and carry by buying spot and selling forward when the aluminium cotango (the dollar premium commanded by forward metal over spot metal) exceeds the cost of money as measured by treasury notes and commercial paper". 9/ The price of metal, therefore, would be subject to normal market forces and would not be subject to manipulation by the producers.

109. The aluminium contract has been operating for some time now. Initially, it was predicted that it would have a general influence on the price of metal traded. 10/ Given the small amounts of metal which were being traded initially, this suggestion was presumptuous. Some students of the industry were rather cautious and preferred to watch developments before making any judgement. 11/

9/ Metal Week, September 4, 1978

10/ Chase Econometric Association in P.M.u.d. [illegible] Dec. 1978.

11/ C.E. Davis, World Demand for Aluminium and the Effect of the new LME Contract on Aluminium.

110. Because of the extremely good demand for metal and the small quantity available on the market when the contract was introduced, prices rose dramatically with a consequential rise in producer list prices. Recently, however, the general economic downturn and the increase in amount of metal available 12/. On the Metal Exchange have brought prices down and forced producers to make heavy discounts on their contract prices.

111. The LME has become a significant trader in aluminium metal; in this recession, sales on the Exchange have had an adverse impact on other prices in the aluminium metal trade. It is therefore important for producers of raw materials in the bauxite, alumina and aluminium industry, whose revenues are closely linked with metal prices, to find ways and means to restore price stability which prior to the LME contract, had characterised the aluminium trade.

5. The International Bauxite Association

112. One organization which strives to secure fair and reasonable returns from the exploitation, processing and marketing of bauxite for its member countries is the International Bauxite Association.

113. At present, its membership is made up of Australia, the Dominican Republic, Ghana, Guinea, Guyana, Haiti, Indonesia, Jamaica, Sierra Leone, Surinam and Yugoslavia. 13/

114. The Association controlled 75 per cent of bauxite production in 1979. It is therefore a formidable organisation in the bauxite trade. Its influence in the alumina trade, however, is not that strong as its members produce only 47.4 per cent of world production. It holds even less power in the metal trade. Member States of the Association produce only 4.5 per cent of the world's aluminium metal.14/

115. A brief comparison between OPEC and IBA follows. The success of OPEC is attributed to the following facts:

(a) Oil demand is price-inelastic: despite a 300 per cent price increase in 1973, demand fell by only 5 per cent in 1974;

(b) Inelastic demand is not unique to oil - it is also true of certain commodities; but oil is vital and not substitutable in the short term (though some power stations can now switch quickly from oil to coal);

12/ On 9 November 1982, the official price on the LME was 995 US dollars per tonne while the ALCAN list price was 1 750 US dollars per tonne and LME stocks were 217 550 tonnes compared to stocks of about 2 000 tonnes in 1978.

13/ Haiti gave notice to withdraw from the Association in November 1982 because of cessation of bauxite production in that country.

14/ Figures called from IBA Secretary General's speech to International Conference of Bauxite Producers & Consumers (Dec. 1980) as reported in Metal Bulletin Monthly - April 1981.

(c) Saudi Arabia could bear whatever cuts in production were needed on behalf of all OPEC countries without feeling the pinch;

(d) OPEC has political cohesion, with its most important members being Middle East Arab countries. 15/

116. The comparison is interesting when similar elements are applied to the IBA.

(i) The short-term demand for price is inelastic. Substitutes have not been developed to the point where they are commercially viable.

(ii) Aluminium, which is the most important derivatives of metallurgical grade bauxite, is not vital to human existence and substitutes are available for many uses of the metal.

(iii) The three most important producers, Australia, Guinea and Jamaica, cannot cut production to maintain high prices because bauxite deposits are abundant and at some cost are substitutable. Besides, Australia has independent producers who cannot, without serious consequences, be made to limit production; Jamaica and Guinea depend so much on Bauxite revenues that they cannot afford to limit production without serious consequences to their foreign currency earnings;

(iv) The IBA has no political and even commercial cohesion. The aim of the group is to maximise earnings from bauxite development.

117. There are four distinct groups within IBA:

a) Those developing countries which at the inception of the Association had no state participation in the industry such as Jamaica, Surinam, Haiti and the Dominican Republic;

b) Those countries with partial participation in the industry such as Ghana and Guinea;

c) Those countries with 100 per cent ownership and control which have to sell their products on the open market such as Yugoslavia and Guyana;

d) Australia.

118. Obviously, divergences in the organisation of the industry in member countries have made it difficult to determine a common ground for advancing IBA's aims.

15/Economist - February 10, 1979.

119. The first group has successfully implemented a bauxite levy which has significantly increased revenues from the bauxite industry to these countries.This has generally afforded increased prices to countries, but not to the same extent as revenues derived from the bauxite levies.

120. Prices of Australian bauxite and alumina have also increased significantly during the period Australia has been a member of the Association; this is not due to application of a bauxite levy or to imposition of a minimum price as advocated by the Association 16/ but to the country's system of export controls which requires Commonwealth Government approval of contract prices for its exports.

121. At the time of inception and in view of the differences between Australia and the other members of the Association on the implementation of minimum prices for products, it was though that Australia would withdraw and the Association would disintegrate. Australia and the other members of the Association, however, have stuck together, In opening the Council of Minister's meeting in Canberra on November 4, 1981 the Prime Minister of Australia commented on the role of his country in the Association:

> "Australia has been a member of the International Bauxite Association since it was formed in 1974. Our membership reflects the importance of bauxite and aluminia to Australia: we are the world's largest producer and exporter of alumina, and we are expanding our production of aluminium. However, our membership also reflects our desire to assist developing countries to achieve fair and reasonable returns for their raw materials exports; and our desire to support international co-operation on commodity trade matters. We also see the promotion of domestic processing of raw materials as a significant means of promoting economic development..... The International Bauxite Association provides a forum which permits member countries to exhange information and views on matters of common interest. I hope that members will continue to find the IBA a valuable forum for these purposes."

122. Considering differences in the systems of Government and the extent of State control of companies in member countries, the Association has done very well in finding a common ground to stay together and to advance means of increasing revenues from the Bauxite and alumina industries.

6. UNCTAD preparatory meeting on bauxite

123. Another institution that may have some influence on revenues in the aluminium industry is UNCTAD. By its Resolution 93(IV) UNCTAD established an Integrated Programme for Commodities, one of which is bauxite. The programme envisaged consultation between consumer and producer governments in order to:

16/ Metal Bulletin, January 12, 1978.

(i) propose appropriate measures and techniques required to achieve the objectives of the integrated programme;

(ii) determine financial requirements resulting from measures and techniques proposed;

(iii) recommend follow-up action through the negotiation of commodity agreements or other measures;

(iv) prepare draft proposals of such agreements for consideration of governments and for use in commodity negotiating conferences. 17/

124. Since 1976 when the Integrated Programme for Commodities was promulgated producers and consumers alike have been considering the applicability of the Programme to bauxite. The funds required to establish, for instance, a buffer stock to stabilise prices are sizeable, and substantial contributions could not be expected from the producers, some of whom depend almost exclusively on bauxite exports for their foreign currency earnings. Furthermore since the major TNCs controlled the industry they could switch production, idle capacity and even stock-pile without Government involvement and did so to maintain prices in soft markets. The relevance of the Programme to bauxite was therefore regarded as questionable until the present depression, which forced the producers to ask for a meeting to consider other ways in which consumer and producer governments could co-operate to improve prospects of the bauxite industry.

125. Unfortunately the meetings held from 8-12 November 1982 were conducted in an atmosphere of confrontation between producers and consumers of bauxite and did not represent a consultation between interested parties coming together to discuss long term inter-governmental measures to improve prospects in the industry. Under the circumstances, the consumers were not prepared to give away any of their advantages. The best that could be achieved was to keep the door open for consultation, should the producers find specific areas of inter-governmental action in the bauxite industry which UNCTAD could uniquely address in the interest of both consumers and producers and which would stabilise revenues from the industry.

126. Serious preparation by the consultation with governments and industry experts will have to take place before any prospect of success can be envisaged for the next meeting.

7. Transfer pricing

127. As stated above the aluminium industry was until recently dominated by a few companies with subsidiaries all over the world which mine bauxite, refine it into alumina, produce metal and fabricate it into final products. These same companies have interests which produce inputs such as caustic soda, refractory bricks and cryolite for the industry and interests in the shipping of products

17/ Culled from IBA Secretariat paper TD/B/IPC/Bauxite/4 prepared for the first bauxite preparatory meeting.

and their marketing. Their aim is the maximization of global profits; since they sell to subsidiaries and affiliates in the same group, each company ensures that it makes the largest profit in the country which taxes it least. Prices put on various products sold to affiliates may not reflect true values and may be higher or lower depending on whether the company wants to make a loss or a profit in a particular host country. These values are more transfer prices.

128. It is therefore understandable that host governments have sought to ensure that these prices reflect real value in order that revenues derived from taxes and other financial duties be equitable to both the government and the company. It is not surprising that revenues derived by Governments from bauxite companies were minimal until the imposition of a bauxite levy in Jamaica, export controls by the Commonwealth Government of Australia and other measures by other producer countries.

129. A well documented examples of transfer pricing in the bauxite industry is that which involved Commonwealth Aluminium Corporation Industries Proprietory Limited (COMALCO Industries Private Ltd.) of Australia and COMALCO Bauxite (Hong Kong) Limited. The latter was 52 per cent owned by COMALCO Industries and 24 per cent each by Showa Denko Kabushiki Kaisha and Sumitomo Chemical Co. Ltd., both of Japan. 18/

130. COMALCO's case as narrated by an Australian Federal Government official, was that in order economically to develop the Weipa Bauxite deposits it was imperative that COMALCO (Australia) secure long term purchase contracts for its products. The Japanese purchasers of Australian bauxite were unwilling, at the time, to enter into long term agreements; they preferred relatively short term or more often spot purchases or better still, direct participation in the Weipa project, all of which COMALCO did not want. As a result the company formed Comalco (H.K.) Limited with the Japanese companies to secure their long term interest in Weipa bauxite. A second purpose was to enter into long term sales contracts which would help to guarantee the external loans which COMALCO required from financial institutions to develop the project.

131. This is a quite plausible explanation of the situation. It does not, however, answer the questions which caused the Commissioner of Taxes to send COMALCO (Australia) to court to recover lost taxes due to the operations of Comalco (H.K.) Ltd.

132. The facts of the case are that Comalco needed the Japanese market in order to reduce unit costs on its Weipa operations. It also needed to satisfy the Commissioner of Taxes that the price of bauxite delivered to its own plant at Gladstone 19/ was comparable to that exported to the Japanese customer. It did not, however, want to deliver the bauxite to the Japanese at cost.

18/ The case is discussed at length by G.J. Crough, "Taxation, Transfer Pricing and the High Court of Australia - A case study of the Aluminium Industry", research Monograph Number 13, Transnational Corporations Research Project, January 1981.

19/ Queensland Alumina Refinery at Gladstone is owned 45 per cent each by Comalco and Kaiser. 10 per cent of the equity is owned by other Australian shareholders.

133. Comalco (H.K.) Limited was therefore created in Hong Kong which had a lower corporate tax than Australia. All transactions were conducted through this company instead of directly with the Japanese partners.

134. From December 11, 1964 letter written to the Managing Director of Sumitomo Chemical Co. Ltd. by the Managing Director of COMALCO Private Ltd., the following is quoted to amplify Comalco's intentions in setting up Comalco (H.K.) Ltd.:

> ...(d) Comalco has therefore proposed to associate the sellter and buyer in a bauxite sales company in order to assure long term sale and supply of bauxite to the mutual benefit of seller and buyer and, in return for a long term commitment, to enable the buyer through a share in the profits of the sales company to obtain bauxite at a more favourable real cost than the ruling world price without harming that price structure.
>
> (e) Comalco has selected Hong Kong as the location for the sales company as the Hong Kong Corporation tax at 12½ per cent is very much lower than the Corporation tax in either Australia or Japan and taxes of the profit to be shared can thus be minimised to the mutual benefit of both Comalco and the Japanese participating companies....

135. By this device, Weipa bauxite was sold to the Japanese customers at a higher price than were deliveries Queensland Alumina and therefore declared to the Australán Government. The price difference was shared between Comalco and its Japanese shareholders in Comalco (H.K.) Ltd.

136. This transfer pricing resulted in considerable loss of tax revenue to the Australian Government since the Weipa operations themselves had a very liberal fiscal regime.

137. Such pricing, unrelated to the real value of the product traded, is common in the aluminium industry. Even today, a charge by the Government of Iceland that Alusuisse has over the years overpriced the cost of alumina and other inputs to its subsidiary, Icelandia Aluminium Company, remains unresolved .

CHAPTER IV

AGREEMENTS IN THE ALUMINIUM INDUSTRY

138. The aluminium industry has been characterised by contract agreements that have guaranteed access to raw materials and other services by transnational corporations in the industry for long periods, over large tracts of land, and under the most liberal fiscal regimes. Revenues host countries have derived from the exploitation of their natural resources have been minimal in relation to returns to these companies.

A. Term of the Agreements

139. Characteristically, agreements cover long periods, with or without rights of renewal at the option of the company on the same terms and conditions save, of course, the right of renewal, at the expiry of the initial term for still another long term.

140. The agreement signed between the chiefs and elders of Sefwi Anwhiaso and Awaso in Ghana and the British Aluminium Company on 27 August 1928 for the exploitation of the Awaso Bauxite Deposits was for a period of 99 years with no clause for review or renewal.

141. In 1952, the State of Johore in Malaysia granted the Aluminium Laboratories of Canada a 25-year mining lease to mine its bauxite. The lease was transferred in 1955 to South East Asia Bauxite Limited, a wholly-owned subsidiary of Alcan Aluminium Limited which also owned Aluminium Laboratories.

142. The most advantageous of these agreements in recent times has probably been "The Bauxite Mineral Prospecting and Mining Agreement (1961) (Ratification) Act No. 35 of 1962," which stipulates that the term of the mining lease shall be 15 years renewable for a further period of fifteen years on the same terms and conditions, save for the financial provisions and the clause for renewal. This was signed between the Government of Sierra Leone and Alusuisse.

143. The worst agreement in the aluminium industry is perhaps that between the Government of the Republic of Ghana and Volta Aluminium Company (VALCO), owned 90 per cent by Kaiser Aluminum & Chemical Corporation and 10 per cent by Reynolds Metals. The Master Agreement became effective on 8 February 1962; except for any right or obligation which is expressed as to endure for any different period or to come into force at/or after the expiry of that period, the agreement shall endure until the fiftieth anniversary of the Permanent Delivery Date specified in the Power Contract (the Permanent Delivery Date is essentially the date of commerical production).

144. The term of the Power Contract is 30 years from the Permanent Delivery Date, but is renewable for a further period of 20 years under certain terms and conditions. 20/

3. Financial arrangements

145. Whereas financial provisions of the agreement were subject to review after the first fifteen years, the VALCO power Contract is renewable for a further period under unchanged terms and conditions.

146. Usually early agreements in the industry provided for no review of financial terms during the period of the contract. Royalties and other rents became anachronistic after the contract had run for a few years. For example, the power tariff of 2.65 mills per kilowatt hour stipulated in the VALCO Power Contract in 1962 was comparable to rates being charged then by the Bonneville Power Authority (BPA); the cost today bears no relationship to power rates being charged by BPA and other power companies. 21/

147. These contracts provided for a limitation of the Corporate Tax payable by the company to a fixed percentage usually lower or equal to the tax rate at the time of signature. In the VALCO Master Agreement, Corporate Tax is limited to 40 per cent of the company's net earnings. Even more serious is the provision made in some contracts for a limitation of total host country financial imposts on the company to a fixed percentage of the company's net earnings. Thus in Act 35 of 1962 of Sierra Leone, referred to above , the Company's tax liability, including all government financial imposts, is limited to 50 per cent of the Company's assessable income in each year of assessment, provided that this amount is not less than the royalties payable for that year. The only revenue guaranteed to the host country each year, therefore, is the royalties.

20/ The "certain terms and conditions" are specified in Article 23(A) of the power Contract which states as follows:

> This Agreement shall become effective on the date hereof and shall remain in effect until the 30th anniversary of the permanent delivery date and shall then expire: provided that this agreement shall continue in effect for an additional period of twenty years after the said thirtieth anniversary of VALCO not less than 3 years and not more than 4 years prior to the said thirtieth anniversary gives notice to the Authority that it shall continue in effect.
>
> The Authority is the Volta River Authority which is the Ghana Government electricity company that runs the Akosombo hydroelectic facilities that supplies power to the VALCO Smelter.

21/ BPA announced increases of tariff to industrial users of its electricity to 25.9 mills per kilowatt hour. VALCO was paying VRA 5 mills per kilowatt hour after three renegotiations demanded by the Government of Ghana.

148. Royalties were paid on a fixed weight of bauxite exported (0.15 Leones per long ton). This arrangement fails to offer returns to the host country for any appreciation in the price of bauxite that may occur. Since 1961, the price of Sierra Leone bauxite has more than trebled.

C. Other provisions

149. These early contracts make feeble or no provision for the training of local personnel, the protection of the environment, participation of host country governments or nationals in the equity of the company, preference for local goods and services of comparable quality, delivery times and such other factors that have become major concerns in order to ensure a fair return to the host country for the exploitation of its natural resources.

D. Tolling arrangements

150. One of the interesting developments in the metal industry generally and on a large scale in the aluminium industry of Australia and New Zealand is the arrangement whereby corporations set up tolling companies to refine their own bauxite into alumina or deliver to the tolling company alumina to be smelted into metal. To some extent this is a logical development from the need for huge capacities in order to cut down unit costs which cannot but must be financed by single companies or joint ventures.

151. There are two types of arrangements of this sort.

1. Service companies

152. Shareholders deliver raw materials to the company to be processed into another product in proportion to their shareholding. The company is funded to the extent of its needs in working capital and its requirements for servicing and paying loans initially contracted. The company does not make any profit and does not pay any taxes but, in Australia, for instance, the shareholders are required by law to incorporate in Australia and are subject to normal corporate tax on their profits from sale of products supplied to them by the service Company. The incorporation of the shareholders in the host country is very important, otherwise the host country is deprived of revenue from the operations since the service company makes no profit.

2. Tolling fee companies

153. These toll material for their shareholders in proportion to their equity holding for a fee which is supposed to cover working capital, debt servicing and a return on invested capital. The fee may be fixed or a proportion of the price of the product delivered to the shareholders.

154. Theoretically in the case of such companies, it is not necessary for shareholders to incorporate in the host country; depending on the tolling fee paid, however, it may be necessary to have the shareholders register in the host country in order to capture taxes on the extra revenue earned from operations in the host country.

CHAPTER V

BARGAINING POSITION OF HOST GOVERNMENTS

155. It is clear from the agreements concluded by TNCs with host governments or nationals of host countries that the latter had very little bargaining power at the time these agreements were being made. This will become more apparent when measures being instituted by host governments to improve their revenues from and their control of the exploitation of their natural resources are discussed.

156. The weak bargaining position is primarily due to the following.

A. Lack of knowledge of the industry and international commerce

157. As discussed above, the first agreements in the bauxite industry in the reports under review were negotiated with the illiterate chiefs of Chana, the bumiputras of the Johore State in Malaysia and the Sierra Leone Government. Although these groups had a high level of native intelligence they could not be expected to understand details of the rights they were signing away. They were invariably content to earn some revenue in the form of a small fee for the exploitation of their resources over long periods for two principal reasons. First, the resource was "useless" to their immediate needs and second, they could not, by any stretch of the imagination, understand what the TNC was getting out of the project.

153. It is true that for the British Colonies the colonial Government was supposed to ensure a fair deal for His Majesty's subjects: in actual fact, however, the interest of the British Government was identical to that of a metropolitan company which also happened to be a British citizen. The policy of the British Empire was to ensure regular and cheap raw materials for metropolitan industries. Thus in relation to the Colonial Government there was a clear case of conflict of interests which was invariably resoved to the benefit of the metropolitan company.

B. Financial constraints

159. The investment needed for projects in the aluminium industry is so huge that external financing is required to bring the projects to fruition. As has been pointed out above, lenders must ensure that their loans will be repaid and will set conditions to guarantee this. One of the conditions is management of

or participation in the project by a technically competent company. Invariably, this is one of the TNCs. This factor gives TNCs an advantageous bargaining position to work out an advantageous arrangement for themselves regardless of what benefits accrue to the host country.

160. Another item on which lenders insist and which adversely affects the bargaining power of host governments is a scheme of assured revenues to the project. This may involve guarantees from shareholders to take portions of product or forward sales of product to other customers at predetermined prices according to prevailing market situation with a premium to the purchaser for guaranteeing long term sales. If such arrangements are made with provision for review in changed circumstances, the host country is protected. But, as is usual, these arrangements are made without any provisions whatever for review. Consequently, conflicts occur between TNCs and host countries when it becomes obvious that the latter is being short-changed through an agreement which, though entered into good faith, has worsened because of changed circumstances.

C. Importance of projects to the overall development strategy of the host country

161. For countries such as Guyana, Surinam, Guinea and especially Jamaica, projects in the aluminium industry are major contributors of revenue for their overall development strategy. Governments are therefore under pressure to maintain production at a very high level or to initiate new projects to bring in more revenue. For countries such as Ghana, Sierra Leone, Brazil and even Australia, the potential for further development in the industry in order to increase revenues is great but it does not constitute the bulk of the countries' earnings in foreign currency. Even so, these countries also are under pressure to develop resources at least to provide employment for their nationals, if not to increase their earnings of foreign currency.

162. This situation is compounded by the abundance of bauxite which makes it possible for TNCs to shop around countries to find out which one will outbid the others in financial incentives to investors. This leaves the host countries very little room for manoeuvering.

CHAPTER VII

DISTRIBUTION OF GAINS

163. The major conflict between host country governments and transnational corporations in the aluminium industry and for that matter, in all investments by TNCs in developing countries has been that of sharing the stream of revenues flowing from projects in the host country. Because of the integrated nature of the industry, the participation of TNCs in all of its stages in different countries and their control of the markets for product, the incidence of transfer pricing at all stages of the industry has been high thus depriving the host country of legitimate revenue. The case of Comalco (H.K.) has already been discussed.

164. This chapter provides additional comparisons between host country earnings and TNC profits.

A. The Volta Aluminium Company (VALCO)

165. As stated above, VALCO is a Tolling Fee Company which smelts alumina to metal for its shareholders, Kaiser and Reynolds. The tolling fee is 60 per cent of the price of 99.5 per cent aluminium ingot as quoted on the American Metal Market or in the Metal Bulletin, whichever is 'lower' minus tariff on metal into the United States.

166. This arrangement effectively excludes 40 per cent of the revenue of the shareholders from their Ghanaian operations from Ghanaian Corporate tax which, at present, is 50 per cent for manufacturing companies. VALCO's tax, after a long tax holiday, is limited to 40 per cent for the period of the agreement. Furthermore products from the VALCO Smelter are not the cheap 99.5 per cent purity metal quoted in the agreement, but higher purity metals and alloys which command higher prices.

167. These, coupled with the low electricity tariff paid by VALCO for power supplied by Volta River Authority (VRA), have led to a description of the smelter project as "a celebrated example of mining companies' priorities prevailing over national plans for development". 22/ This criticism has been generated not only because of the financial provisions of the VALCO Master Agreement, but also because VALCO has, according to the Agreement, first call on the electricity provided by VRA; should there be any reason to shed power, all users, including public utilities, shall be limited to the proportion that VALCO is made to cut power.

168. Table 6 shows the revenues of VALCO and its shareholders from operations and compares Kaiser's world wide profits to revenues generated from its operations in Ghana. It is quite clear that VALCO plays a significant role in Kaiser's world wide operations; in 1971 and 1972 it subsidized the rest of Kaiser's operations.

169. When this is compared to Table 7 which summarises VALCO's contribution to Ghana's balance of payments, it is clear that the only payment unrelated to service charges is the contribution to the VALCO Trust Fund. During the 1967-1978 period VALCO paid no taxes because it was on a tax holiday or had managed to waive tax because of unjustified claims on the Government. As compared to total net earnings of US$242.72 million for Kaiser and US$26.97 million for Reynolds during this period, the Host Government earned only US$1.5 million.

B. Revenues from the Guinea Bauxite and Alumina Companies

170. In order to assess the benefits to the Host Country of the operations of companies in the industry it is important to detail the arrangements under which the companies operate, in this case, the 1963 Investment Cold . The Code makes the following provisions.

22/G. Lanning and M. Muller, Africa Undermined (Peguin 1979), on Volta River Project.

1. Shareholding

171. In both Compagnie des Bauxites de Guinee (CBG) which mines the Boke Bauxite deposits and Compagnie Friguia which processes bauxite into alumina the Government of Guinea has 49 per cent equity and the foreign partners have 51 per cent equity.

2. Equity contribution

172. Equity is established by agreement between the foreign partners and the Government but should not be less than pre-construction expenses.

173. The foreign partners, B Shareholders, provide all the equity in cash. The government, A Shareholder, is given equity in return for the grant of mining rights, the provision of previous work done on the deposits and such other incentives as long term guaranteed fiscal regime for the company.

3. Place of incorporation

174. The company should be incorporated in Guinea and have its registered office in Conakry.

4. Administration and management

175. The Company is administered by a board whose chairman is appointed by Government and its vice-chairman by the foreign investors. The day-to-day management is controlled by a management committee headed by a General Manager who is appointed by B Shareholders. The Deputy General Manager is appointed by Government, the A Shareholder.

5. Financial provisions

176. Government revenues are derived from corporate tax which is 30 per cent of taxable income; dividends accruing to Government through its A shares, which is 50 per cent of after-tax profits instead of 49 per cent according to its equity; and special levy on export of products. This levy is paid by the purchaser of the product, not by the company.

177. By Act 010/AL/75, the Export Levy Act, every tonne of bauxite exported attracts a levy of 0.50 to 0.70 per cent of the ALCAN price per tonne of 99.5 per cent purity of primary aluminium according to the alumina content of the bauxite. For alumina the percentage is 1.00 and for aluminium 0.20. Since 2.2 - 2.4 tonnes of bauxite provide 1 tonne of alumina and 1.95 tonnes of alumina can be converted to 1 tonne of aluminium metal, the levy provides an incentive for further local processing.

178. There is no tax on transfer of dividends of the foreign partners.

Table 6 - Earnings of VALCO and its Shareholders from the smelter operations

Year	Valco Annual Production Short Tons (a)	Aluminium price $ per lb (b)	Valco Sales Revenues $ Million (c)	Valco Profits $ million (d)	Valco Owners Revenues $ Million e=0.785c	Alumina Cost to Valco Owners $ Million (f)	Profits of Valco owners $ Millions g=(e-f)	Profits Attributable to Kaiser from Valco's Operations $ million h=0.90(d+g)	Net Income of Kaiser $ Million i	Profits from Valco's Operations as a Percentage of Kaiser Profits.k=h/i
1967	44 000	0 25	11 57	(0 67)	9.08	7.02	2 06	1 25	58 8	2 13
1968	120 000	0 26	35 02	4 27	27 49	17 05	13 24	15 76	49 0	32.16
1969	125 000	0 27	36 88	7 02	28 95	14 69	14 26	19 15	70 4	27 20
1970	125 000	0 29	37 88	4 30	29 74	17 63	12 11	14 77	50 6	29 19
1971	122 000	0 29	37 15	4 07	29 16	15 71	13 45	15 77	10 0	157 70
1972	159 000	0 27	44 13	8 56	34 64	22 50	12 14	18 63	12 7	146 69
1973	166 000	0 25	44 98	4 53	35 31	19 35	15 96	18 44	27 1	68 04
1974	173 000	0 34	62 29	19 00	48 90	29 94	18 96	34 16	110 9	30 80
1975	158 000	0 40	68 52	17 43	53 79	33 51	20 28	33 94	94 7	35 84
1976	162 000	0 45	71 27	9 89	55 95	35 67	20 28	27 15	44 5	61 01
1977	169 000	0 51	102 98	11 03	80 84	40 52	40 32	46 22	112 1	41 23
Total	1523 000		552 67	89 43	433 88	253 59	180 26	242 72	635 8	

Source: Compiled by the Director of Finance, Chana Aluminium Industries Commission.

Table 7

Contribution to Ghana's balance of payments (U.S. Dollars Thousands)

Year Actual	VRA Power	Smelter Spending	Loan Repayments	Construction Expenditures	Taxes	Valco Trust Fund Valco	Total
1967	$2 101	$2 271		$1 677			6 049
1968	4 898	3 868	$1 029	39			9 834
1969	5 177	4 230					9 407
1970	5 287	4 817					10 104
1971	5 083	3 963	170			$300	9 516
1972	5 768	2 799	384			100	9 051
1973	7 219	6 666	836			100	14 821
1974	9 289	9 436	1 141	571		200	20 637
1975	7 908	9 494	1 075	1 063		200	19 740
1976	8 232	15 375	1 025	6 155		200	30 987
1977	16 590	19 118	1 425	539		200	37 872
1978	10 288	13 732	897			200	25 117
	$87 840	$95 769	$7 982	$10 044	- 0 -	$1 500	$203 135

Table 8
Earnings breakdown for Friguia and CBG
(Thousands of US dollars)

	1975	1976	1977	1978	1979	1980	1981
I. Friguia							
Government	3821	7059	9059	9562	16059	21353	21210
Tax and dividends	0	0	0	0	2672	4278	5800
Special export levy	3821	6439	5308	7182	9027	11940	11092
Half of miscellaneous taxes (export, import administration)	n.d.	620	2751	2380	4360	5735	4318
"B" partners	0	0	0	0	1439	2303	2500
Dividends	0	0	0	0	1439	2303	2500
II. CBG							
Government	31480	43835	85334	80717	97705	150892	161581
Tax and dividends	0	0	11781	10801	12177	33225	48091
Special export levy	31480	43062	72736	69033	84753	116487	113503
Half of miscellaneous taxes (import, turnover)	n.d.	773	817	923	775	1190	1177
"B" partners	0	0	8344	5816	6557	17890	25254
Dividends	0	0	6344	5816	6557	17890	25254

Source: Consolidated financial statements (1975-1981) of Friguia, certified by Price Waterhouse, and reports to meetings of the Board of Directors.

Final statements for tax purposes and CBG financial statements (1975-1981), certified by Coopers and Lybrand.

Note: n.d. no date

6. Infrastructure

179. Because of the availability of loans with concessionary terms for infrastructural developments, the Government undertook to provide infrastructure for the project and raise tariffs on the companies for its use.

(a) Guarantees for loan capital

180. All loans required by the projects are contracted by the Company from commercial and international financial institutions but guaranteed by both the joint-venture foreign partners individually and the Government.

(b) Linkages

181. The Government reserves the right to ship 50 per cent of the product for eventual marketing, although at present it markets only 10 per cent of the product.

(c) Compagnie des Bauxites de Guinea.

182. Table 8 shows the distribution of revenues to Government and to the foreign joint-venture partners for the years 1975-81.

183. It should be observed that without the special export levy, returns would have been indeed very modest to both the government and joint-venture partners. Revenues to the latter, however, are not limited to their earnings in Guinea. The Guinea operation only provides the raw material for further earnings. Even prior to any further processing, the TNCs make money on the shipping of the product to the alumina plant.

(d) FRIGUIA

184. Table 8 also shows the revenues accruing to Government and to the joint-venture partners from this company. Here again the significant contributor to Government revenue is the special export levy.

185. It must be remembered, however, that Guinea has been able to levy the special export tax and maintain its position in the aluminium trade because of its exceptionally high quality bauxite ore, its political stability and its rather liberal fiscal regime. Other countries in the Carribean that applied similar levies have experienced considerable cut-backs in production which has seriously affected their balance of payments.

CHAPTER VII

HOST GOVERNMENT ACTION TO RESTRUCTURE THE INDUSTRY

186. It has been demonstrated above that the structure of the industry favours the TNCs. Developing host Governments and even Australia have had to take measures, if not to reverse the trend, at least to minimise loss in legitimate revenue to the State. These measures are summarised hereunder.

A. Establishment of Aluminium Commissions

187. One of the major defects in the bargaining power of developing country governments in dealing with TNCs is their lack of information on the industry. Even when information is available, host countries lack capacity to monitor the activities of these corporations.

188. This shortcoming is being rectified through establishment of institutes, commissions and even corporations by the Governments to study, promote projects and monitor activities of TNCs in the industry and advise on the action to take at any time.

189. Several such organizations were established in the early 1970s. The best known is the Jamaican Bauxite Institute, an outgrowth of the group set up to prepare for the negotiations for the bauxite levy. Surinam has a similar organisation called the Bauxite Institute Suriname. Guyana has a Bauxite Development Company which is handling the development of an integrated aluminium industry for the country and of hydro-electric facilities to service it, Ghana has the Aluminium Industries Commission which promotes projects, monitors agreements in the industry and even sells metal to the local industry.

190. These new organisations are necessary because previous arrangements which had TNCs reporting to different government organisations on different facets of their activities left no single organisation responsible for their activities; as a result, knowledge gathered from dealing with TNCs was so diffused in different Government organisations that it could not be properly used to regulate the companies.

191. Present arrangement, with a single organisation responsible for overseeing TNC activities, ensures the building up of expertise and knowledge to deal effectively with the transnational corporations.

B. Producer Associations

192. As has already been described above the International Bauxite Association provides a forum for sharing information and taking concerted action for the benefit of bauxite producers. This is a global extension of the institutes that are being created in host countries.

C. Producer and consumer dialogue

193. To provide a forum for discussion of problems in the industry and of concerns of producers of raw materials for the industry, in December 1980, the IBA initiated the International Conference of Bauxite Producers and Consumers in Ocho Rios, Jamaica.

194. The conference which was well attended by both producers and TNCs established the need for both sides to meet, discuss, and find solutions to the concerns of producers. Although it started of coolly with TNCs attempting to find out exactly what the producers wanted, by the end of the conference some useful exchanges had taken place.

195. This dialogue contrasts sharply with the November 1982 UNCTAD meeting on which was confrontational and did not succeed in bringing together both sides to discuss problems of mutual concern.

196. Another meeting which is becoming an important source of information in the industry and provides a forum for discussion, (but which is not initiated by producer Governments), is the Metal Bulletin Aluminium Conference. Some heated exchanges have occurred at these meetings, but they generally provide opportunity for both informal and formal discussions which are important in the development of understanding between the TNCs and producers.

D. Host country participation in the industry

197. As has already been described, host Governments, in order to increase revenues from aluminium industry projects and control the industry, have initiated action to participate in existing projects and ensure equity in new projects as a matter of course.

198. Another interesting development is that host country nationals have been encouraged to participate in the industry in order to ensure higher retained earnings in the host country. Thus in Malaysia, when the Johore Mining and Stevedoring Company Sdn. Berhad (JOMIS) Agreement expired in 1977, it was renewed with 30 per cent equity passing on to private, local shareholders.

199. To ensure that they also benefit from linkages to the industry, host governments have now moved to guarantee that they also benefit from shipping of the product. Thus at the moment Guinea ships one tenth of its bauxite exports. Guybulk of Guyana ships considerable bauxite all over the world.

E. Regional integration

200. Host countries have realised that one of the areas likely to improve their returns from the industry and their capacity for borrowing for the development of projects is regional integration. In the 1970s, Jamaica proposed some such projects which, for various reasons have not materialised.

201. One of the proposals was the Javemex project: this would have brought together Jamaica, Venezuela and Mexico in a company which would mine Jamaican bauxite and turn it into alumina to be smelted with cheap power in Venezuela and Mexico.

202. Another proposal was to join Trinidad, Jamaica and Guyana in a similar project to process alumina from Guyana and Jamaica into metal in Trinidad.

F. Bauxite levy

203. The most significant departure from traditional fiscal arrangements in the industry has been the introduction of the bauxite levy. It has markedly increased revenues to host countries as demonstrated by income accruing to both CEG and Friguia in Guinea.

204. The merits of the levy are that it captures the intrinsic value of the resource which had been ignored in the calculations of the TNCs and, at the same time, links the price of bauxite to freely traded aluminium. It thus exposes the tax to the realities of the market situation, something that no TNC can fault.

205. Criticisms advanced to date not dispute the fairness of the arrangement but the amount of the tax, something host countries are always prepared to discuss and adjust if they can be convinced so to do.

G. Export contract price control

206. Although Australia has never been prepared to interfere unduly in the operations of private companies, the Federal Government has the power to approve or otherwise the price at which exports, including bauxite and its derivatives, are sold. This power has been used to ensure that bauxite prices are fair and not depressed for the benefit of TNC affiliates or associates.

H. Financing of projects by host governments

207. The problem of securing finances for projects has been referred to earlier as a constraint on the bargaining power of host country governments in developing their industry to meet national objectives. Because TNC operations are spread over several countries, even when all the elements are present in one country it may not be in the global interest of the TNC to integrate the industry in the host country.

208. Host country governments have attempted to do so themselves with considerable difficulty. India has managed to do it with Eastern European help; both Ghana and Indonesia, however, are still negotiating against very heavy odds to build alumina refineries which would integrate the industries in these countries. If they can secure the finances required for the projects, they will be in a position to control, to a large extent, the industry at least within their own borders.

CHAPTER VIII

CONCLUSION

209. This study has examined the bargaining power of developing producer countries in negotiating agreements and their attempts to improve it so as to gain control of various sectors of the aluminium industry. Although significant studies have been made to restructure agreements, transnational corporations have been able to retain their position of advantage. This is primarily due to the vertical integration of TNC operations, to their presence in numerous countries world wide and, more importantly,to the fact that developing countries must compete for foreign investment.TNCs continue to device disproportionate income from their operations despite improvements in revenues to producer countries.

210. The aim of this study is to provide producer country governments with the information required in bargaining with investors in order to obtain equitable returns from exploitation of their natural resources. To the extent that information was available in the reports under review, this study provides at least a basis for further education in the field of bauxite industry.